

BOOK REVIEW

BOTANICAL SYSTEMATICS. An Occasional Series of Monographs. Vol. 1. Series Editor, V. H. Heywood. London, New York, San Francisco: Academic Press, 1976. £24.00.

The publication of a first volume in a new series is always interest-provoking: usually it is also significant, since it is often indicative of progress either in the establishment of a new field of research, or of expansion in an existing field by the incorporation or development of new techniques. The book presently under review is both significant and interesting. In editing it, Professor Heywood has pointed out that with the application of techniques such as scanning electron microscopy and phytochemistry to taxonomic research, there is a need for the publication of extended treatments, often heavily illustrated, and this at a time when scientific journals are increasingly unable to accept lengthy papers. The present new series is the outcome of these two contingencies.

Two papers comprise this first volume. Dr Hanks and Professor Fairbrothers studied the pollen morphology of forty-one of a total of fifty-four known species of *Fagus* and *Nothofagus*. They used scanning techniques and ultrasonification for observation of exine ultrastructure where light microscopy failed to differentiate taxa within the four pollen groups recognized for the two genera. The palynological data obtained were used to produce computerized diagnostic keys, and were also combined with existing morphological, anatomical, cytological and fossil record data in an endeavour to establish a working hypothesis that would reflect the evolutionary relationships of the pollen types. Since, in these genera, the pollen fossil record is extensive and well documented, it was thought that from such relationships, evidence of the migration routes of the genera through time might be deduced. The results are provocative, for they differ from those of other researchers based on other fields of study, and suggest that *Fagus* is more primitive than *Nothofagus*, both genera having developed from prototypes differentiated from a world-wide ancestral type. These conclusions carry considerable interest in the light of modern concepts of continental drift. It would seem that the choice of these genera for the work in hand could not have been bettered at the time it was carried out.

In the second paper Dr Polhill presents the results of a most comprehensive study of Genistae and Related Tribes of the Leguminosae. This paper occupies the major part of the book: surprising were this not so, for vegetative organs, inflorescence, flowers as functional units, their parts, fruits, seeds, anatomy, chromosome numbers, chemical constituents, the definition of tribes and genera, keys to genera and conclusions have been given for upwards of fifty genera.

Dr Polhill's masterly account leads one to the statement that his study must serve as a model that will be difficult to improve upon for many years to come. His knowledge of the plants appears encyclopaedic, yet the facts have been integrated to produce a very readable account of a most interesting group of papilionates, some indigenous to the Mediterranean, others to South Africa (especially the western Cape) others to Australia. Pages of most helpful, excellently executed illustrations show comparisons of calyces, corollas, stamens, stigmas, fruits and seeds. Despite this dissection, the concept of these plants as functional organisms has not been lost: flowers are treated as serving a reproductive purpose in producing seed viable for establishment of the succeeding generation.

Both papers provide a wealth of detailed information that appears extremely accurate and well-indexed: each is supported by a comprehensive bibliography. The book, itself, is pleasing to handle, neat, compact and well produced. It is undoubtedly a specialist publication, fascinating as an illustration of what new techniques have meant to taxonomy; challenging to those undertaking research in comparable fields; not of direct relevance to S. African botany, apart from the work on S. African legumes; not for the layman or the undergraduate except perhaps to show what may be achieved. If other volumes in the series maintain the same standards of research and production, there is much to look forward to.

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